

### *Amendments to the Claims*

The listing of claims will replace all prior versions, and listings of claims in the application.

1. (Currently amended) A method for receiving an optical data signal, ~~comprising the steps of:~~ comprising:
  - (1) receiving an optical data signal;
  - (2) converting the optical data signal to an electrical signal having a symbol rate;
  - (3) ~~converting the electrical signal to a digital electrical signal; and~~ generating N sampling signals having a first frequency that is lower than the symbol rate, the N sampling signals shifted in phase relative to one another;
  - (4) ~~digitally processing the digital electrical signal.~~ controlling N analog-to-digital converter ("ADC") paths with the N sampling signals to sample the electrical signal at the phases, so as to produce samples;
  - (5) performing one or more M-path parallel digital processes on the samples, wherein  $M=kN$ , and k is an integer or a number in the form of  $1/s$ , where s is an integer; and
  - (6) generating a digital signal representation of the optical data signal from the samples.
2. (Currently amended) The method according to claim 1, wherein step ([4]) 5 comprises ~~the step of equalizing the digital electrical signal.~~ performing an equalization process on the samples.
3. (Currently amended) The method according to claim 2, wherein step ([4]) 5 further comprises ~~the step of performing a Viterbi equalization process on the digital electric signal.~~ samples.
4. (Currently amended) The method according to claim 2, wherein step ([4]) 5 further comprises ~~the step of performing a feed-forward equalization process on the digital electric signal.~~ samples.

5. (Currently amended) The method according to claim 2, wherein step ([4]) 5 further comprises ~~the step of~~ performing a decision feedback equalization process on the ~~digital electric signal~~ samples.
6. (Currently amended) The method according to claim 2, wherein step ([4]) 5 further comprises ~~the step of~~ performing Viterbi equalization and feed-forward equalization processes on the ~~digital electric signal~~ samples.
7. (Currently amended) The method according to claim 2, wherein step ([4]) 5 further comprises ~~the step of~~ performing Viterbi equalization and decision feedback equalization processes on the ~~digital electric signal~~ samples.
8. (Currently amended) The method according to claim 2, wherein step ([4]) 5 further comprises ~~the step~~ performing one or more of the following types of equalization processes on the ~~digital electric signal~~ samples:
  - Viterbi equalization;
  - feed-forward equalization; and
  - decision feedback equalization.
9. (Currently amended) An optical receiver, comprising:
  - ~~an a receiver~~ input;
  - an optical-to-electrical converter coupled to the receiver said input;
  - an analog-to-digital converter ("ADC") array of N ADC paths, wherein N is an integer greater than 1, each said ADC path including an ADC path input coupled to an output of the said optical-to-electrical converter; and
  - an M-path digital signal processor coupled to the said analog-to-digital converter. ADC array, wherein  $M=kN$  and k is an integer or a number in the form of  $1/s$ , where s is an integer.
10. (Currently amended) The optical receiver according to claim 9, wherein the said digital signal processor includes an equalizer.

11. (Currently amended) The optical receiver according to claim 10, wherein the said equalizer comprises a Viterbi equalizer.
12. (Currently amended) The optical receiver according to claim 8 10, wherein the said equalizer comprises a feed-forward equalizer.
13. (Currently amended) The optical receiver according to claim 8 10, wherein the said equalizer comprises a decision feedback equalizer.
14. (Currently amended) The optical receiver according to claim 8 10, wherein the said equalizer comprises a Viterbi equalizer and a feed-forward equalizer.
15. (Currently amended) The optical receiver according to claim 8 10, wherein the said equalizer comprises a Viterbi equalizer and a decision feedback equalizer.
16. (Currently amended) The optical receiver according to claim 8 10, wherein the said equalizer comprises a feed-forward equalizer and a decision feedback equalizer.
17. (Currently amended) The optical receiver according to claim 8 10, wherein the said equalizer comprises one or more of:
  - a Viterbi equalizer;
  - a feed-forward equalizer; and
  - a decision feedback equalizer.
18. (Currently amended) An optical receiver, comprising:
  - means for receiving an optical data signal;
  - means for converting the optical data signal to an electrical signal having a symbol rate;
  - ~~means for converting the electrical signal to a digital electrical signal; and~~
  - generating N sampling signals having a first frequency that is lower than the symbol rate, the N sampling signals shifted in phase relative to one another;
  - ~~means for digitally processing the digital electrical signal.~~ controlling N analog-to-digital converter ("ADC") paths with the N sampling signals to sample the electrical signal at the phases to produce samples;

means for performing one or more M-path parallel digital processes on the samples, wherein  $M=kN$ , and k is an integer or a number in the form of  $1/s$ , where s is an integer; and

means for generating a digital signal representation of the optical data signal from the samples.

19. (Currently amended) The system according to claim 18, wherein the said means for performing digital processes on the samples ~~digitally processing the digital electrical signal~~ include means for equalizing the ~~digital electrical signal~~ samples.

20. (Currently amended) The system according to claim 19, wherein the said means for equalizing the digital electrical signal samples comprise means for performing a Viterbi equalization process on the ~~digital electrical signal~~ samples.

21. (Currently amended) The system according to claim 19, wherein the said means for equalizing the digital electrical signal samples comprise means for performing a feed-forward equalization process on the ~~digital electrical signal~~ samples.

22. (Currently amended) The system according to claim 19, wherein the said means for equalizing the digital electrical signal samples comprise means for performing a decision feedback equalization process on the ~~digital electrical signal~~ samples.

23. (Currently amended) The system according to claim 19, wherein the said means for equalizing the digital electrical signal samples comprise means for performing Viterbi equalization and feed-forward equalization processes on the ~~digital electrical signal~~ samples.

24. (Currently amended) The system according to claim 19, wherein the said means for equalizing the digital electrical signal samples comprises means for performing Viterbi equalization and decision feedback equalization processes on the ~~digital electrical signal~~ samples.

25. (Currently amended) The method according to claim 1 2, wherein step (1) comprises ~~the step of~~ receiving the optical data signal from a multimode optical fiber and step ([4]) 5) comprises ~~the step of~~ equalizing multimode dispersion from the multimode optical fiber.

26. (Currently amended) The method according to claim 1 2, wherein step (1) comprises ~~the step of~~ receiving the optical data signal from a single mode optical fiber and step ([4]) 5) comprises ~~the step of~~ equalizing chromatic and/or waveguide dispersion from the single mode optical fiber.

27. (Currently amended) The method according to claim 1 2, wherein step (1) comprises ~~the step of~~ receiving the optical data signal from a multimode optical fiber and step ([4]) 5) comprises ~~the step of~~ equalizing chromatic and/or waveguide dispersion from the multimode optical fiber.

28. (Currently amended) The method according to claim 1 2, wherein step (1) comprises ~~the step of~~ receiving the optical data signal from a single mode optical fiber and step ([4]) 5) comprises ~~the step of~~ equalizing polarization mode dispersion from the single mode optical fiber.

29. (Currently amended) The method according to claim 1 2, wherein step (1) comprises ~~the step of~~ receiving the optical data signal from a single mode optical fiber and step ([4]) 5) comprises ~~the step of~~ equalizing dispersion induced in the single mode optical fiber by laser chirping.

30. (Currently amended) The method according to claim 1 2, wherein step (1) comprises ~~the step of~~ receiving the optical data signal from a transmitter that lacks external modulators, and step ([4]) 5) comprises ~~the step of~~ equalizing excess dispersion induced by laser chirping.

31. (Currently amended) The optical receiver according to claim 10, wherein the ~~said~~ input is coupled to a multimode optical fiber and the ~~said~~ equalizer equalizes multimode dispersion from the multimode optical fiber.

32. (Currently amended) The optical receiver according to claim 10, wherein the said input is coupled to a single mode optical fiber and the said equalizer equalizes chromatic and/or waveguide dispersion from the single mode optical fiber.

33. (Currently amended) The optical receiver according to claim 10, wherein the said input is coupled to a multimode optical fiber and the said equalizer equalizes chromatic and/or waveguide dispersion in the multimode optical fiber.

34. (Currently amended) The optical receiver according to claim 10, wherein the said input is coupled to a multimode optical fiber and the said equalizer equalizes polarization mode dispersion from the single mode optical fiber.

35. (Currently amended) The optical receiver according to claim 10, wherein the said input is coupled to a single mode optical fiber and the said equalizer equalizes dispersion induced in the single mode optical fiber by laser chirping.

36. (Currently amended) The optical receiver according to claim 10, wherein the said input receives the optical data signal from a transmitter that lacks external modulators, and the said equalizer equalizes excess dispersion induced by laser chirping.

37. (Currently amended) The optical receiver according to claim 19, wherein the said means for receiving an optical signal is coupled to a multimode optical fiber and the said means for equalizing comprises means for equalizing multimode dispersion from the multimode optical fiber.

38. (Currently amended) The optical receiver according to claim 19, wherein the said means for receiving an optical signal is coupled to a single mode optical fiber and the said means for equalizing comprises means for equalizing chromatic and/or waveguide dispersion from the single mode optical fiber.

39. (Currently amended) The optical receiver according to claim 19, wherein the said means for receiving an optical signal is coupled to a multimode optical fiber and the said means for equalizing comprises means for equalizing chromatic and/or waveguide dispersion in the multimode optical fiber.

40. (Currently amended) The optical receiver according to claim 19, wherein the said means for receiving an optical signal is coupled to a multimode optical fiber and the said means for equalizing comprises means for equalizing polarization mode dispersion from the single mode optical fiber.
41. (Currently amended) The optical receiver according to claim 19, wherein the said means for receiving an optical signal is coupled to a single mode optical fiber and the said means for equalizing comprises means for equalizing dispersion induced in the single mode optical fiber by laser chirping.
42. (Currently amended) The optical receiver according to claim 19, wherein the said means for receiving an optical signal receives the optical data signal from a transmitter that lacks external modulators, and the said means for equalizing comprises means for equalizing excess dispersion induced by laser chirping.
43. (Currently amended) The method according to claim 1, wherein step ([4]) 5) comprises ~~the step of~~ decoding a convolutional code.
44. (Currently amended) The method according to claim 1, wherein step ([4]) 5) comprises ~~the step of~~ decoding a trellis code.
45. (Currently amended) The method according to claim 1, wherein step ([4]) 5) comprises ~~the step of~~ decoding a block code.
46. (Currently amended) The optical receiver according to claim 9, wherein the said digital signal processor comprises a convolutional decoder.
47. (Currently amended) The optical receiver according to claim 9, wherein the said digital signal processor comprises a trellis decoder.
48. (Currently amended) The optical receiver according to claim 9, wherein the said digital signal processor comprises a block decoder.

49. (Currently amended) The optical receiver according to claim 18, wherein the said means for performing digital processes on the samples ~~digitally processing the digital electrical signal~~ comprises means for decoding a convolutional code.
50. (Currently amended) The optical receiver according to claim 18, wherein the said means for performing digital processes on the samples ~~digitally processing the digital electrical signal~~ comprises means for decoding a trellis code.
51. (Currently amended) The optical receiver according to claim 18, wherein the said means for digitally performing digital processes on the samples ~~digitally processing the digital electrical signal~~ comprises means for decoding a block code.